We claim:

1. Optical data storage and reading device comprising:

- a multilayer fluorescent information-carrying optical disc;
- a source of reading radiation;
- means for focusing the reading radiation into a micro-spot of the multilayer disc;
- means for spatially separating the reading radiation from information-carrying radiation; and
- means for detecting an availability of bit information in the micro-spot.

2. Device according to claim 1, wherein the means for spatially separating comprises a spectrum filter.

3. Device according to claim 2, wherein the spectrum filter comprises a dichroic filter.

4. Device according to claim 2, wherein the spectrum filter comprises a smectic liquid crystal.

5. Device according to claim 2, wherein the spectrum filter comprises a Notch filter.

6. Device according to claim 5, wherein the Notch filter is a liquid crystal Notch filter.

7. Device according to claim 5, wherein the Notch filter is a Notch filter tuned over a spectrum.

8. Device according to claim 1, wherein the means for spatially separating comprises a polarization removable film polarizer.

9. Device according to claim 1, wherein the means for spatially separating comprises an electrically controlled polarization filter of a Pockels cell type.

10. Device according to claim 1, further comprising a light controlling element for increasing an amount of the information-carrying radiation which reaches the detector.

11. Device according to claim 10, wherein the light-collecting element is located on a non-readable side of the fluorescent disc.

12. Device according to claim 10, wherein the light-collecting element comprises an angle mirror.

13. Device according to claim 10, wherein the light-collecting element comprises a pyramidal light-collecting element.

14. Device according to claim 12, wherein the angle mirror is made as a separate element.

15. Device according to claim 12, further comprising a device for following a displacement of the angle mirror.

16. Device according to claim 12, wherein the angle mirror consists of plurality of micro-angle mirrors.

17. Device according to claim 12, wherein the angle mirror is located directly on a surface of the fluorescent disc.

18. Device according to claim 16, wherein the plurality of said micro-angle mirrors are located on a back surface of the fluorescent disc.

19. Device according to claim 16, wherein a geometrical size of each of said micro-angle mirrors is much less than a spot size of the micro-spot.

20. Device according to claim 1, further comprising a compensating electronic device for compensating for an influence of dye fluorescence lifetime.

21. Device according to claim 20, wherein the compensating electronic device is located in an electric output scheme of the detector.

22. Device according to claim 1, wherein the means for spatially separating is located in front of the detector.

23. Device according to claim 1, wherein the detector comprises a first detector for detecting the information-carrying radiation when the information-carrying radiation has a wavelength equal to a wavelength of the reading radiation and a second detector for detecting the information-carrying radiation when the information-carrying radiation has a wavelength different from the wavelength of the reading radiation.

24. Device according to claim 23, wherein the means for spatially separating comprises an optical element for directing the information-carrying radiation to one of the first detector and the second detector in accordance with the wavelength of the information-carrying radiation.

25. Device according to claim 24, wherein the optical element is a dichroic mirror.

26. Device according to claim 24, wherein the optical element is a movable filter.

27. A multilayer hybrid fluorescent optical disc, comprising a substrate and successively located information-carrying layers (surfaces), spatially divided by polymer layers and assembled together in a single unit by adhesive layers and covered with a protective layer from the substrate back side.

28. Fluorescent optical disc according to claim 27, wherein the substrate, said intermediate

and adhesive layers of the disc are transparent to reading radiation.

29. Fluorescent optical disc according to claim 27 with said intermediate layers of 10-300 μm thick.

30. Fluorescent optical disc according to claim 27, wherein said information-carrying layers comprise surfaces with optically detectable marks (pits).

31. Fluorescent optical disc according to claim 30, wherein the optically detectable marks are fluorescent.

32. Fluorescent optical disc according to claim 31, wherein the information-carrying layers are constructed such that an intensity of a detected signal is constant and independent of a distance of each information layer from the disc surface.

33. Fluorescent optical disc according to claim 32, wherein an absorption of fluorescent information marks grows with increasing layer number.

34. Fluorescent optical disc according to claim 30, wherein each optically detectable mark is 0.6 μm wide.

35. Fluorescent optical disc according to claim 31, wherein each information-carrying surface is covered with a continuous layer of a fluorescent substance which has a largest thickness above the information-carrying pits comparatively to regions outside pits.

36. Fluorescent optical disc according to claim 31, wherein each information-carrying layer comprises a fluorescent substance which fills only the pits.

37. Fluorescent optical disc according to claim 27, wherein all the said layers of multilayer disc are fluorescent ROM layers.

38. Fluorescent optical disc according to claim 37, wherein at least one fluorescent layer is of WORM or RW type.

39. Fluorescent optical disc according to claim 30, wherein all the layers have nearly the same refraction index.

40. Fluorescent optical disc according to claim 27, wherein the intermediate layers are made from photo-cured liquid compositions.

41. Fluorescent optical disc according to claim 27, wherein liquid photo-polymerized intermediate layers also serve as adhesive layers.

42. Fluorescent optical disc according to claim 27, wherein dry photopolymer films serve as intermediate layers.

43. Fluorescent optical disc according to claim 27, further comprising reflective ROM, WORM or RW layers.

44. Fluorescent optical disc according claim 43, wherein said reflective layers are located behind the fluorescent layers.

45. Fluorescent composition for a hybrid fluorescent optical disc, comprising

- One or more polymerized liquid low-volatile components
- Solvent, consisting of one or more components
- Polymerization catalysts
- One or more substances, capable to fluoresce
- Additives, improving homogeneity of luminophores' distribution in the composition.

46. Composition according to claim 45, wherein the said polymerizing component is optically or radio-chemically cured.

47. Composition according to claim 45, wherein the said polymerizing component is thermally cured.

48. Composition according to claim 45, wherein solvent has vapors which are more volatile than said liquid polymerized components' vapors.

49. Composition according to claim 45, wherein the solvent contains components with reactive a functional groups capable of being polymerized together with the said polymerizing components.

50. Composition according to claim 45, wherein the said luminophore contains components with reactive functional groups capable of being polymerized together with the said polymerizing components.

51. Method of obtaining a hybrid fluorescent optical disc, comprising subsequent layer-by-layer forming of said information-carrying layers with microrelief like pits or spiral grooves, filling of ROM, WORM or RW microrelief with said fluorescent material and their assembling them together to form a multilayer structure.